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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Docket No: Q67528

Noriaki SAITO, et al.

Appln. No.: 10/000,364

Group Art Unit: 1711

Confirmation No.: 9783

Examiner: Duc Truong

Filed: December 04, 2001

For: METHOD OF PRODUCING NOVOLAK RESIN

RESPONSE UNDER 37 C.F.R. § 1.111

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is in response to the Office Action dated April 17, 2003. A three-month Petition for Extension of Time is being filed herewith, making a response due October 17, 2003. This response is timely filed. With this Response, Applicants submit an Information Disclosure Statement and request consideration of those references.

Claims 1-9 are all the claims pending in the application.

Claims 5-9 are withdrawn as being directed to non-elected species.

Claims 1-4 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,121,412 ("Wanat") or U.S. Patent 6,045,966 ("Rahman").

Wanat is asserted to disclose a method of reacting formaldehyde with one or more phenolic compounds in the presence of an acid catalyst, such as oxalic acid catalyst at temperature from 95-200°C under pressure.

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Rahman is asserted to disclose a method of producing a phenol novolak resin by reacting phenolic compounds with formaldehyde using an oxalic acid catalyst at 110-175°C under atmospheric pressure.

It is conceded in the Action that the references do not disclose Applicants' claimed ortho-cresol, as in claim 3, or the novolak resin having an ortho ratio of 30% or more, as in claim 1.

In view of this deficiency in the cited art, it is asserted that the references disclose the use of phenolic compounds, in general, or more specifically, meta- and para-cresol. It is stated that it would have been obvious to one of ordinary skill in the art to select the ortho-cresol to replace the meta- and para-cresol of the references to react with formaldehyde under the disclosed conditions.

In response, Applicants respectfully traverse, because neither Wanat nor Rahman presents the basis for a *prima facie* obviousness rejection.

Applicants respectfully disagree that Wanat discloses a method for reacting a formaldehyde with one or more phenolic compounds, at temperature from 95-200°C under pressure.

Wanat does not teach that the reaction is conducted at 110-160°C under pressure, as in Applicants' claims. The reaction of Example 1 of Wanat was conducted at 90-95°C for 6 hours, and then the mixture was distilled at a temperature at 200°C. (See example 1). Further, it is disclosed that after the reaction, a vacuum is drawn for distillation. The reaction and subsequent distillation occur in the same vessel. Wanat does not disclose any pressure release between the reaction and distillation, so Wanat does not disclose Applicants' claimed reaction under pressure.

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In regard to Rahman, it is stated that a method is disclosed for producing a phenol novolak resin by reacting a phenolic compound with formaldehyde using an oxalic acid catalyst at 110-175°C.

However, the reaction of Example 1 of Rahman was conducted at 95-110°C for 3 hours, and then the mixture was distilled at a temperature at 175-200°C. Rahman does not teach the reaction conducted at 110-160°C under pressure taught by the present invention.

Further, Rahman discloses a reaction occurring at atmospheric pressure. Therefore, Rahman discloses that the state of the art is to run the reaction at atmospheric pressure, not under pressure as in Applicants' claims.

The methods in Wanat and Rahman are conventional methods, such as that recited in the present specification, page 2, lines 7-9; *i.e.*, reacting for longer times, or conducting dehydration while increasing the temperature.

Therefore, a *prima facie* showing of obviousness is not present in Wanat or Rahman. Even in combination, the asserted references do not disclose or suggest all of the recitations of Applicants' claims. Not only do the references fail to disclose the claimed ortho-cresol and the claimed ratio of ortho-cresol, but the references also do not disclose reacting the cresol under pressure at the specified temperature.

Moreover, experimental data from Applicants' specification clearly rebuts any suggestion of obviousness.

Comparative Example 1 of the present specification describes a reaction of cresol with phenol, which was conducted at 90°C for 2 hours. P-toluenesulfonic acid was added, and then

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dehydration was conducted over about 6 hours while increasing the temperature. After the temperature reached 130°C, the solution was kept at constant temperature for 2 hours. Even though the reaction was conducted as above, the yield was low, and the amount of phenol in the exit stream was not sufficiently reduced. The present invention unexpectedly provides a method which offers a solution to these problems, and is therefore not obvious over the cited references.

For at least these reasons, it is respectfully requested that the rejections under 35 U.S.C. § 103 be reconsidered and withdrawn.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,


Keith B. Scala
Keith B. Scala
Registration No. 43,088

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

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